# Pathology resident education in laboratory administration and clinical chemistry is less effective than other areas of pathology, as measured by the ASCP Resident In-Service Examination (RISE)

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## Context

Pathologists, the directors of most hospital and commercial laboratories, obtain fundamental training in laboratory medicine during residency. The American Society for Clinical Pathology has provided the Residency Inservice Examination (RISE) to pathology residency programs for over 20 years. The RISE is used as an assessment tool by every pathology residency program in the US, and examines clinical chemistry, cytopathology, forensics, hematopathology, immunopathology, laboratory administration, microbiology, surgical pathology, transfusion medicine, and special topics (molecular pathology, cytogenetics, flow cytometry).

## Objective and Methods

For pathology residents completing training in years 1999 through 2004, the differences in mean scores between the first and fifth years were compared to ascertain whether scores increase uniformly in all content areas Effective training in laboratory medicine should result in increasing scores in all RISE content areas.

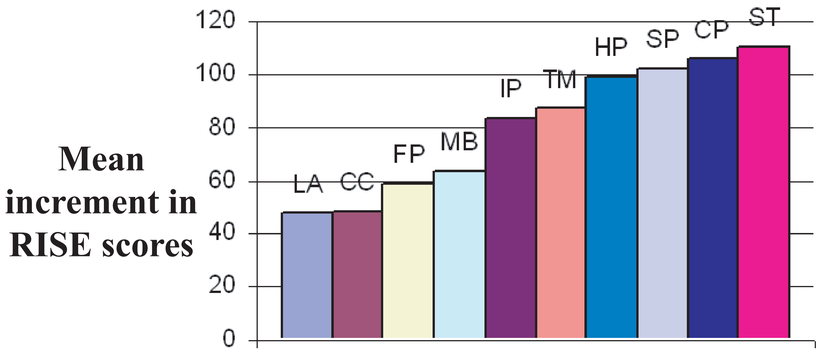
**RISE Results by Graduating Class**

| Year of training | Overall | CC | CP | FP | HP | IP | LA | MB | SP | ST | TM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Class of 1999** | | | | | | | | | | | |
| 1 | 393 | 383 | 378 | 409 | 405 | 424 | 428 | 407 | 404 | 376 | 408 |
| 2 | 448 | 455 | 443 | 450 | 451 | 447 | 447 | 453 | 448 | 442 | 444 |
| 3 | 443 | 433 | 447 | 446 | 447 | 451 | 443 | 434 | 446 | 442 | 432 |
| 4 | 476 | 459 | 496 | 474 | 478 | 463 | 460 | 474 | 488 | 493 | 480 |
| 5 | 486 | 453 | 502 | 480 | 491 | 480 | 488 | 483 | 502 | 494 | 480 |
| *Increment* | *93* | *70* | *124* | *71* | *86* | *56* | *60* | *76* | *98* | *118* | *72* |
| **Class of 2000** | | | | | | | | | | | |
| Year of training | Overall | CC | CP | FP | HP | IP | LA | MB | SP | ST | TM |
| 1 | 420 | 433 | 404 | 435 | 409 | 430 | 436 | 425 | 414 | 434 | 407 |
| 2 | 425 | 428 | 425 | 423 | 425 | 424 | 438 | 428 | 422 | 421 | 421 |
| 3 | 453 | 446 | 463 | 454 | 452 | 438 | 451 | 451 | 460 | 468 | 452 |
| 4 | 478 | 462 | 489 | 478 | 484 | 481 | 480 | 477 | 488 | 481 | 473 |
| 5 | 478 | 450 | 490 | 468 | 482 | 484 | 463 | 466 | 498 | 501 | 473 |
| *Increment* | *58* | *17* | *86* | *33* | *73* | *54* | *27* | *41* | *84* | *67* | *66* |
| **Class of 2001** | | | | | | | | | | | |
| Year of training | Overall | CC | CP | FP | HP | IP | LA | MB | SP | ST | TM |
| 1 | 399 | 414 | 393 | 406 | 383 | 402 | 413 | 406 | 396 | 388 | 393 |
| 2 | 436 | 443 | 435 | 442 | 431 | 421 | 433 | 438 | 441 | 442 | 434 |
| 3 | 463 | 454 | 470 | 464 | 467 | 458 | 466 | 464 | 468 | 466 | 460 |
| 4 | 473 | 454 | 480 | 467 | 481 | 476 | 457 | 469 | 489 | 504 | 471 |
| 5 | 467 | 444 | 480 | 465 | 474 | 467 | 463 | 457 | 483 | 470 | 470 |
| *Increment* | *68* | *30* | *87* | *59* | *91* | *65* | *50* | *51* | *87* | *82* | *77* |
| **Class of 2002** | | | | | | | | | | | |
| Year of training | Overall | CC | CP | FP | HP | IP | LA | MB | SP | ST | TM |
| 1 | 403 | 426 | 388 | 417 | 393 | 390 | 412 | 409 | 401 | 409 | 400 |
| 2 | 438 | 454 | 436 | 443 | 464 | 439 | 436 | 441 | 431 | 438 | 448 |
| 3 | 449 | 440 | 454 | 448 | 454 | 446 | 445 | 447 | 452 | 458 | 449 |
| 4 | 452 | 439 | 456 | 450 | 459 | 455 | 449 | 444 | 461 | 460 | 454 |
| 5 | 492 | 495 | 489 | 493 | 484 | 492 | 492 | 484 | 490 | 491 | 484 |
| *Increment* | *89* | *69* | *101* | *76* | *91* | *102* | *80* | *75* | *89* | *82* | *84* |
| **Class of 2003** | | | | | | | | | | | |
| Year of training | Overall | CC | CP | FP | HP | IP | LA | MB | SP | ST | TM |
| 1 | 380 | 392 | 370 | 394 | 366 | 391 | 410 | 392 | 374 | 364 | 373 |
| 2 | 414 | 422 | 411 | 409 | 415 | 423 | 416 | 417 | 413 | 409 | 416 |
| 3 | 432 | 421 | 438 | 428 | 435 | 432 | 435 | 427 | 440 | 433 | 436 |
| 4 | 478 | 478 | 474 | 476 | 468 | 475 | 476 | 469 | 473 | 475 | 471 |

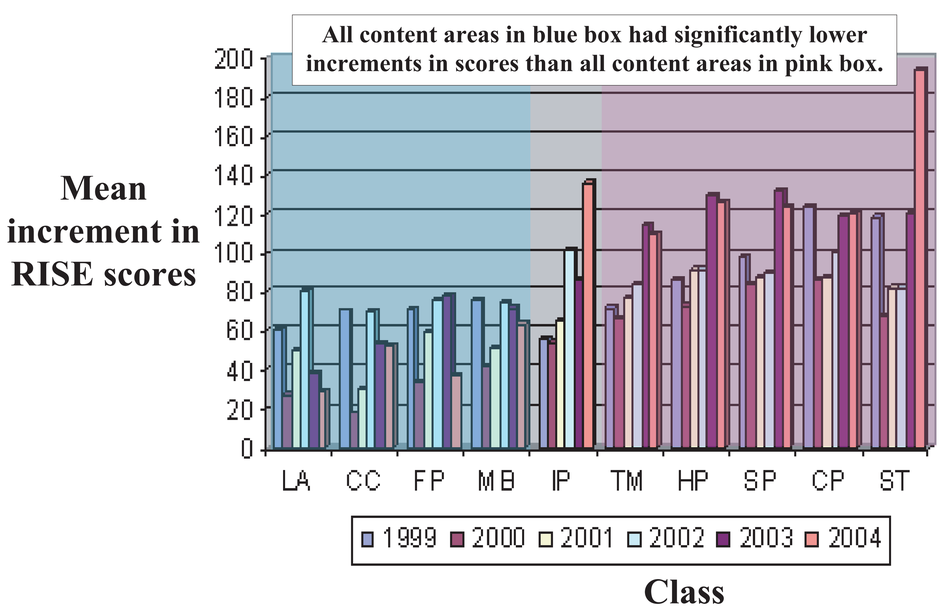
**Mean Increments in RISE Sores by Class and Content Area**

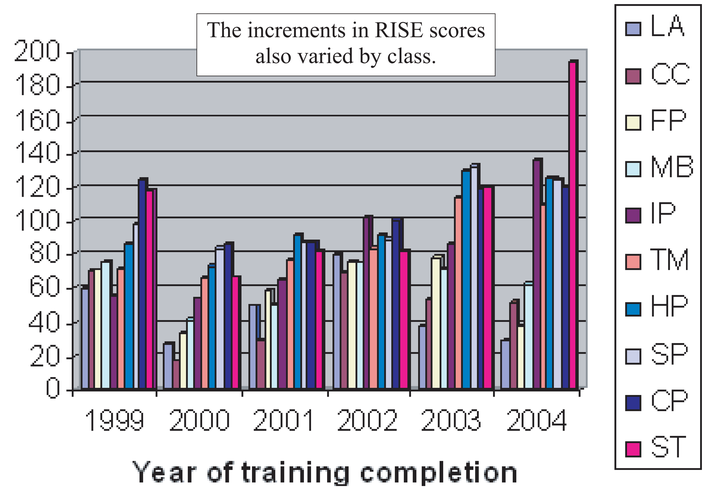
| Class of | overall | CC | CP | FP | HP | IP | LA | MB | SP | ST | TM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2004 | 94 | 52 | 120 | 37 | 126 | 136 | 29 | 63 | 124 | 194 | 110 |
| 2003 | 100 | 53 | 119 | 78 | 130 | 86 | 38 | 72 | 132 | 120 | 114 |
| 2002 | 89 | 69 | 101 | 76 | 91 | 102 | 80 | 75 | 89 | 82 | 84 |
| 2001 | 68 | 30 | 87 | 59 | 91 | 65 | 50 | 51 | 87 | 82 | 77 |
| 2000 | 58 | 17 | 86 | 33 | 73 | 54 | 27 | 41 | 84 | 67 | 66 |
| 1999 | 93 | 70 | 124 | 71 | 86 | 56 | 60 | 76 | 98 | 118 | 72 |
| Mean increment | 83.66667 | 48.5 | 106.1667 | 59 | 99.5 | 83.16667 | 47.33333 | 63 | 102.3333 | 110.5 | 87.16667 |

## Increments in RISE scores by content area




LA=Laboratory administration, CC=Clincal chemistry, FP=Forensic pathology , MB=Microbiology, IP=Immunopathology, TM=Transfusion medicine, HP=Hematopathology, SP=Surgical pathology, CP=Cytopathology, ST=Special topics




## Conclusions and Questions

The effectiveness of pathology residency training appears to vary by content area, with laboratory administration having the lowest increment in RISE scores. If improving quality in laboratory medicine depends on effective laboratory directors, more attention should be directed toward graduate medical education in laboratory administration.

These findings generate more questions than conclusions. Why the differences?

***Do pathology residency programs do a better job in anatomic than clinical pathology?***

***Do the differences reflect more effective learning in the more "hands on" content areas?***

***Do the differences reflect the fundamental motivations of most residents for entering pathology?***

***Does the RISE do a better job assessing knowledge in some areas than others?***